

NAME

Key

DATE

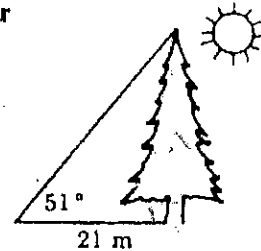
P374
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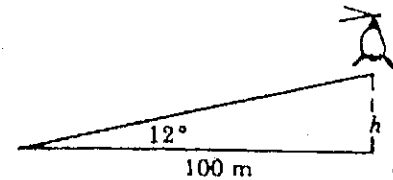
Using Trigonometric Ratios

In Exercises 1-7, express the lengths correct to the nearest meter and angle measures correct to the nearest degree. Use the table on page 271 in the text.

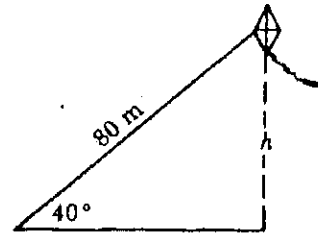
1. A tree casts a shadow 21 m long. The angle of elevation of the sun is 51° . What is the height of the tree? 25.9 m $\tan 51 = \frac{h}{21}$



2. A helicopter is hovering over a landing pad 100 m from where you are standing. The angle of elevation with the ground is 12° . What is the altitude of the helicopter? 21.3 m $\tan 12 = \frac{h}{100}$



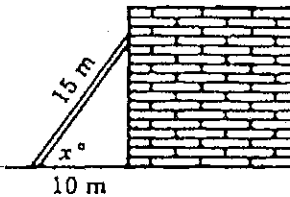
3. You are flying a kite and have let out 80 m of string. The angle of elevation with the ground is 40° . If the string is stretched straight, how high is the kite above the ground? 51.4 m $\sin 40 = \frac{h}{80}$



4. A 15 m pole is leaning against a wall. The foot of the pole is 10 m from the wall. Find the measure of the angle the pole makes with the ground. 48.2° $\cos x = \frac{10}{15}$

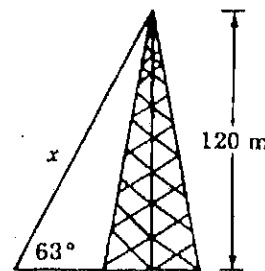
$$\cos x = \frac{10}{15}$$

$$x = 48.2^\circ$$

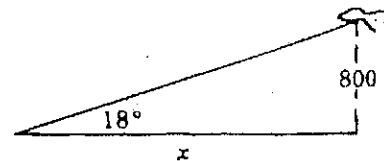


5. A guy wire reaches from the top of a 120 m television transmitter tower to the ground. The wire makes a 63° angle with the ground. Find the length of the guy wire. 134.7 m $\sin 63 = \frac{120}{x}$

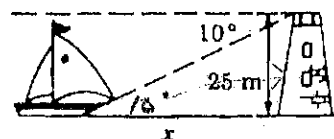
$$\sin 63 = \frac{120}{x}$$



6. A small airplane climbs at an angle of 18° with the ground. Find the horizontal distance it has flown when it has reached an altitude of 800 m. 2462.1 m $\tan 18 = \frac{800}{x}$

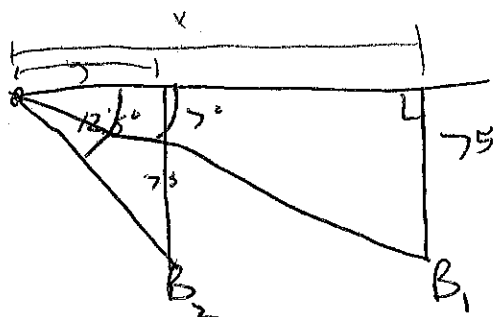


7. An operator at the top of a lighthouse sights a sailboat. The point from which the sighting is made is 25 m above sea level. The angle of depression of the sighting is 10° . How far is the boat from the base of the lighthouse? 141.8 m $\tan 10 = \frac{25}{x}$



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8.



$$\tan 7 = \frac{75}{x} \quad \tan 12.5 = \frac{75}{y}$$

$$x = 610.8$$

$$y = 338.3$$

$$272.5m$$

13. $\tan 8 = \frac{60}{x} \quad \tan 11 = \frac{60}{y}$

$$x = 426.9$$

$$308.7 = y$$

$$118.2 yds$$